said flywheel rim has a modulus of elasticity e_r in said hoop direction and a density ρ_r; and a rim ratio R_r equal to E_r / ρ_r

wherein R_l is less than or equal to R_r, so said flywheel rim liner grows radially with said rim.

10. A process of coupling a flywheel rim to a flywheel hub, comprising:

mounting said rim on a rim liner; and

coupling said rim liner to said hub with a torque coupling that allows said liner to grow radially with respect to said hub while remaining concentric thereto during operation.

13. A process as defined in claim 10, wherein:

said rim includes an inner annulus of E-glass/epoxy and an outer annulus of carbon fiber/epoxy having less material than said E-glass annulus;

whereby said carbon fiber/epoxy annulus is large enough to provide sufficient hoop strength to contain radial forces created in said rim by rotation while allowing significant radial growth of said rim away from said hub, and said rim liner maintains torque coupling and concentricity of said rim and said hub during said operation despite said radial growth.

15. A flywheel system, comprising:

a hub;

a flywheel rim concentric on said hub having a carbon fiber/epoxy outer annulus and, contiguous therewith, an E-glass inner annulus with an inner circumferential surface;

a rim liner engaged with [redacted] circumferential surface of said inner annulus;

said rim liner being made of a material that grows radially with said rim and has sufficient strength to transmit torque between said rim and said hub during flywheel spin-up and during energy recovery from said flywheel; and

a torque coupling between said hub and said rim liner that allows said liner to grow radially with respect to said hub while remaining concentric thereto during operation.

18. A flywheel system as defined in claim 17, wherein:

said spline teeth of said liner have a Poisson's Ratio which causes said teeth to be compressed under their own centrifugal loading as said rotor is spun to operating speed, causing said teeth to become wider, thereby tightening the connection between the liner teeth and hub, to help keep the rotor stable.

Remarks

Applicants respectfully request entry of this amendment and reconsideration of this application as amended herein.

Applicants respectfully request an extension of one month to the shortened statutory period for response to the Outstanding Office Action dated June 7, 2002. The extension fee is submitted herewith by way of the attached Credit Card Authorization Form.

This amendment is intended to comply with the Examiner's invitation in paragraph 7 of the Outstanding Office Action to shown that know-how exists, without extensive research by the manufacturing industry, to follow the teachings in the specification to produce the claimed invention, thereby overcoming the §112 rejection set forth in paragraph 1 of the Outstanding Office Action. An affidavit, with Exhibit A, illustrates and explains the information that is available from suppliers and the open literature about the characteristics of materials used in modern flywheels, and shows how that information is applied in accordance with the teaching in the specification to make the invention.

Specifically, the affidavit illustrates an example of the data that is available from suppliers about the materials they sell, and other open literature sources, and shows how that data is used to make the simple calculations to ensure that the rim liner always remains in compressive contact with the rim.

This Amendment also complies with the Examiner's suggestion to delete "high speed" and "maximum speed" from claims 7, 10, 13, 15 and 18 to remove the grounds for the §112 rejection of claims 7, 8 and 10-20.

The Examiner asks how the strain-to-failure capability of greater than 4%, as claimed in claim 14 is produced. The Examiner's understanding of this term is correct.